

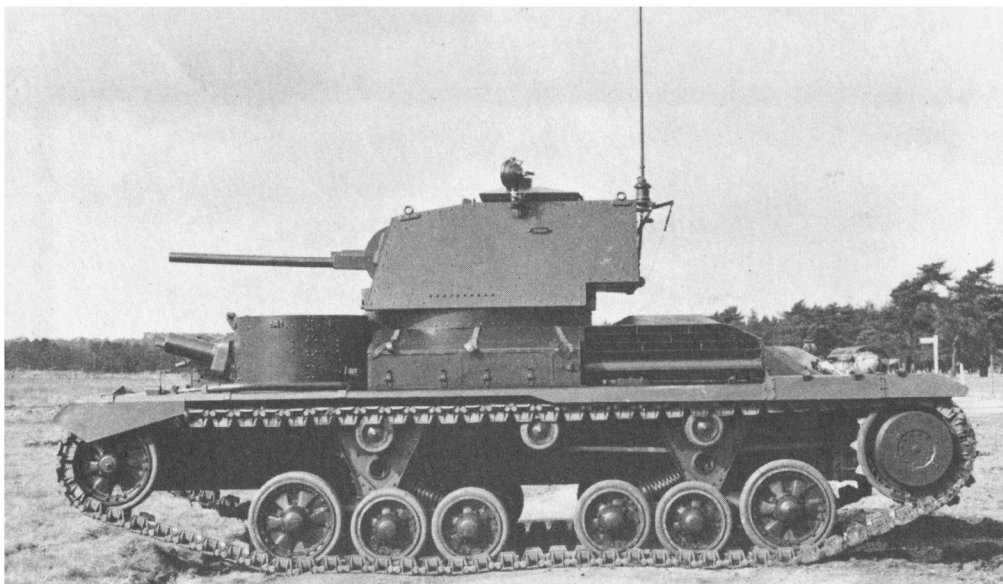


SERIES SEVENTEEN

Cruiser Tank Mk I & Mk ICS (A9)	(UK)
M 26 "General Pershing"	(US)
Light Tank M.2.A.1	(US)
Panzerkampfwagen II Ausf F	(GE)



MILITARY VEHICLE PRINTS



Above: This excellent side view photograph of the Cruiser Tank Mark I (A9) will give you a better insight into the complicated suspension system. The mechanism for raising and lowering the radio aerial is also clearly visible. (Photo: Peter Chamberlain collection)

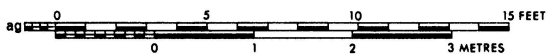
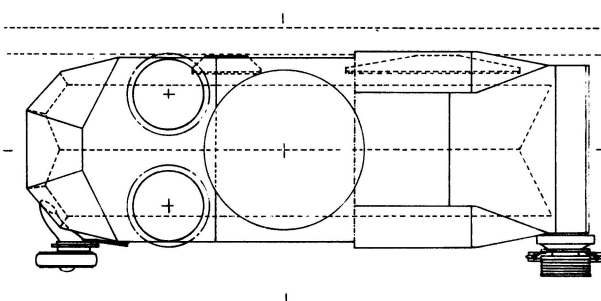
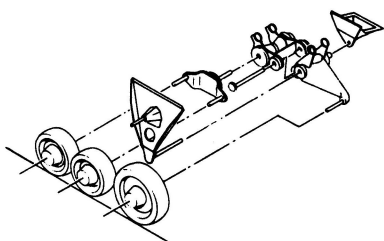
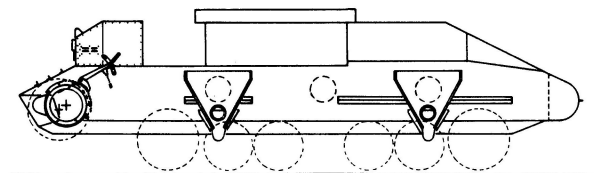
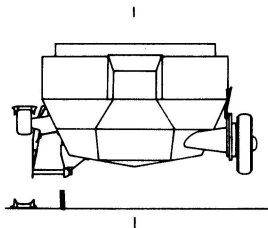
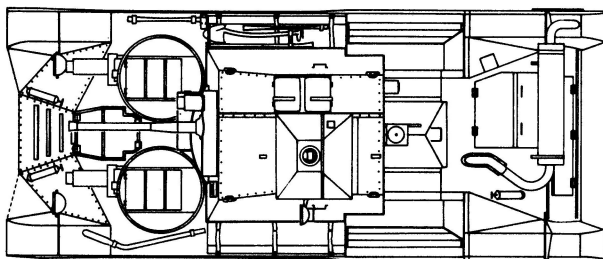
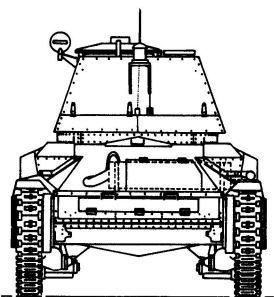
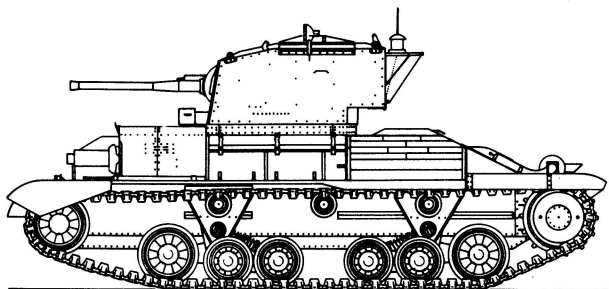
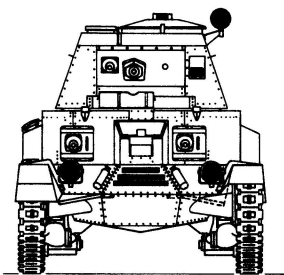
Cover illustration by George Bradford.

The A9 Cruiser tank operated in the desert during the early campaigns which were fought in Libya during 1941. These A9's were painted sand overall so as to blend with the desert conditions. Some vehicles, however, were further camouflaged by the application of elongated black and dark grey patches over their basic sand colour. Divisional and unit numbers made up the remaining markings, whilst nearly all vehicles had a name painted on the rear of the turret. This name was appropriate to their Squadron - thus "A" Squadron had tanks with the name commencing with the letter "A".

When the A9 was operating in France in 1940 it was painted in the normal dark green, sometimes with additional dark earth patches. The usual divisional and unit markings were applied to these tanks.

Below: The advent of the M 26 "Pershing" in service for the first time gave American tank troops a tank capable of meeting the German Panzerkampfwagen "Panther" and "Tiger" on equal terms. It was in fact a very similar vehicle in specification to the Tiger Ausf E, but had advantages being somewhat lighter. Here a group of American troops look on as a "Pershing" passes. (U.S. Official Photo)





CRUISER TANK Mark 1 [A9]

SCALE 1:76 (4mm to 1foot) Drawn by A. GOOCH

In May 1934, after abandoning the A6 series of experimental Medium Tanks because of their high cost, the Director of Mechanisation invited Sir John Carden of Vickers to design a smaller and less costly vehicle. This was required in two versions, Cavalry and Infantry to be designated A9 and A10. They were to have the same engine, transmission and suspension. The A9 was to have a 14mm armour basis and the A10 a 25mm basis. Carden was given a free hand in the design, subject to normal basic requirements. The power unit did present a problem to the designers, due to Government reluctance to spend money on the development of a tank engine they were forced to use a commercial engine.

The pilot model A9.E1. T 1356, BMM 133 appeared in April 1936 and proved quite successful on trials, but was returned for modifications to the suspension. In the meantime Carden had been killed and this work was not satisfactorily completed until eighteen months later. By that time 60mm was considered essential for Infantry tanks and 30mm for Mediums.

In June 1937 a meeting was held to decide whether the A7.E3, A9 or A10 would be adapted as a stop-gap Medium. Trials were held between the three vehicles. Curiously A9 was chosen and therefore went into limited production, but since their construction was not suitable for mass production by non-armament manufacturers, all hopes were now pinned on the new Christie Cruiser. The first A9 vehicles appeared in August 1937 and were designated Cruiser Tank Mk I. The main armament was the new 2-pdr which replaced the obsolete 3-pdr. The gun was mounted co-axially with a .303 Vickers machine-gun but a few of the early vehicles mounted the old 3-pdr. A Close-Support version mounting a 3.7 in mortar in place of the 2-pdr was also produced in small numbers.

Several interesting features were introduced on the A9; the Vickers-Gerlach Tank Periscope which was a considerable improvement over the direct vision blocks used previously, and Powered hydraulic traverse which was used for the first time on a British tank. The hull was of single skin riveted construction. The engine was an AEC engine already widely used in Buses. It was directly mounted to a single dry plate clutch and five speed sliding pinion gearbox. Power was delivered to a 1:1 ratio bevel gearbox with output shafts passing through a multi-plate clutch, flexible joint, single speed compound epicycle reduction gear, steering brake and single ring 14 tooth sprocket on each side.

The clutch and brake steering incorporated a new method of holding the steering clutch plates in contact by direct pressure from a toggle action on a quick thread sleeve. When the vehicle was in motion the brake drum was rotating with the brake drum shaft, the inner end of which formed the primary sun gear and rotated 10.2 times faster than the sprocket. The sprocket rotated with the brake shoes and was coupled to the secondary planet carrier. When the steering levers were fully forward the steering clutches were held together, transmitting the drive, when pulled back, the first movement caused the pressure to be released on the clutch thus freeing the drive. Further movement caused further withdrawal of the clutch pressure and application of the brake shoes.

Suspension was of the slow motion type, six wheels on each side in two bogies. The bogie assemblies were comprised of one 24 and two 19½ inch rubber tyred wheels. The primary suspension fork pivoted on the bogie spindle, one end carried the large wheel, the other end carried a short extension with a spindle on which pivoted the secondary fork. The other end of the secondary fork carried the spindle of the pivoting bogie bracket, on each end of which was mounted the small bogie wheels. A trunnion was carried on the primary and secondary fork between which were supported the single coil spring with enclosed telescopic shock absorbers. The idler wheels at the front of the vehicle were interchangeable with the large bogie wheels. Track tensioning was carried out by adjusting idler eccentrically mounted axle with a ratchet arc and pawl. The radiator was mounted to the right of the engine. Cooling air was drawn through the left louvers, passing over the engine, through the radiator and oil cooler and exhausting through the right louvers. Air could also be drawn through the Fighting Compartment to facilitate ventilation.

Very little further experimental work seems to have been done using the A9 as a basis. A series of trials were carried out at the Experimental Bridging Establishment sealing tanks for underwater running. An A9 successfully negotiated a submerged crossing of the River Stour at the EBE in May 1940.

A9's saw action with the 1st Arm.Div. in France in 1940 and with the 7th Arm.Div. in the Western Desert until 1941.

Technical Specification for Cruiser Tank Mk I and Mk ICS (A9)

Crew: 6.

Weight, Combat loaded: 28068 lbs. 12.53 Long tons.

14.034 Short tons. 12.73 Tonnes.

Performance

Speed, Max. Road: 23 m.p.h. (37 Km.p.h.)

Ground pressure: 10.6 lbs/sq.ins (0.745 Kg/sq.cm)

Range (internal fuel) Road: 100 Miles (161 Km)

Power to weight ratio: (Gross) 12.1 HP/ton

Dimensions

Length overall: 19' 0" (579 cm) to 20' 1" (612 cm)

Width: 8' 5" (256.5 cm)

Height: 8' 5" (256.5 cm)

Ground clearance: 1' 6" (45.7 cm)

Fire height of gun: 6' 9" (206 cm)

Turret ring dia: 5' 0" (152 cm)

Road wheel dia: 24" (61 cm) and 19½" (49.5 cm)

Trackwork

Centres: 7' 2" (218 cm)

Length on ground: 10' 3½" (314 cm)

Width: 10.7" (27.1 cm)

Pitch: 4½" (11.4 cm) x 1½" (4.4 cm)

Number of links per track - 78. Type: Cast malleable iron, twin guide lugs. Double lubricated hardened steel pins.

Mechanical Details

Engine: AEC A179 Normally aspirated, liquid cooled, OHV, 6-cyl-inder in line gasoline engine. Bore and stroke 4.72 x 5.6 = 585.8 cu.in. (120 x 142 mm = 9600 cc) 150 b.h.p. @ 2200 r.p.m.

Transmission: Meadows type 22 5F & 1R speed sliding pinion gearbox

Steering: Clutch & Brake.

Suspension: Slow motion, single coil springs, hydraulic telescopic shock absorbers.

Armament.

Main: OQF 2-pdr Mk 9-10A.

Calibre: and length in calibres: 40 mm (1.575 ins), L/50

Traverse: 360 degrees. Operation: Power hydraulic and hand for main turret. Hand only for auxiliary turrets.

Secondary armament: Three .303 Vickers W/C Machine guns.

One co-ax with main armament. two in aux. turrets.

C.S. Model OQF 3.7" Mortar Mk I 94 mm/L15.

Stowage

Ammunition, main armament: 100 rds.

Ammunition, secondary armament: 300 rds.

Internal Fuel capacity: 72 imp. gals. 86.4 U.S. gals. 327.1 Litres.

Armour.

Riveted

Type: Rolled steel plates 14 mm Max - 6 mm Min.

Hull,

Nose upper: at 31 degrees.

Glacis plate: at 62 degrees.

Drivers plate: at 0 degrees.

Sides, upper: at 0 degrees.

lower: at 25 degrees.

Decking: at 90 degrees.

Engine covers: at 63 degrees.

Belly: at 80 degrees.

Turret

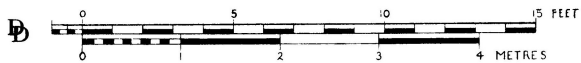
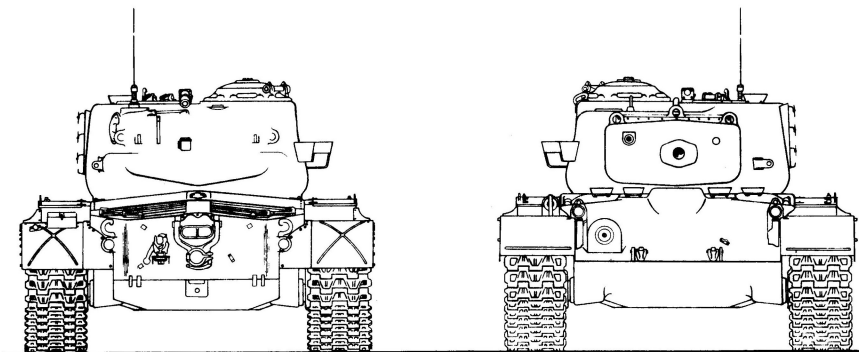
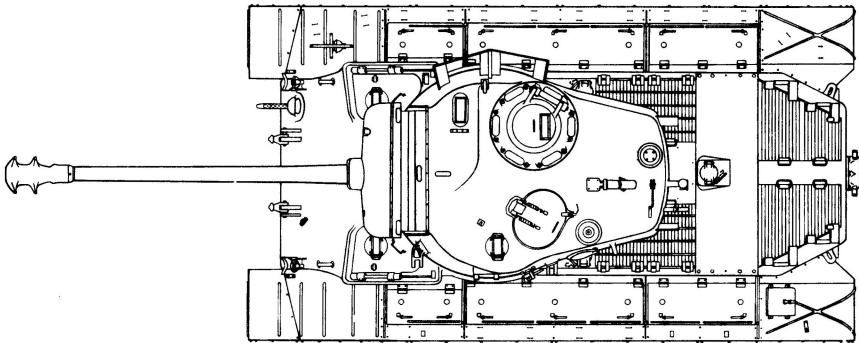
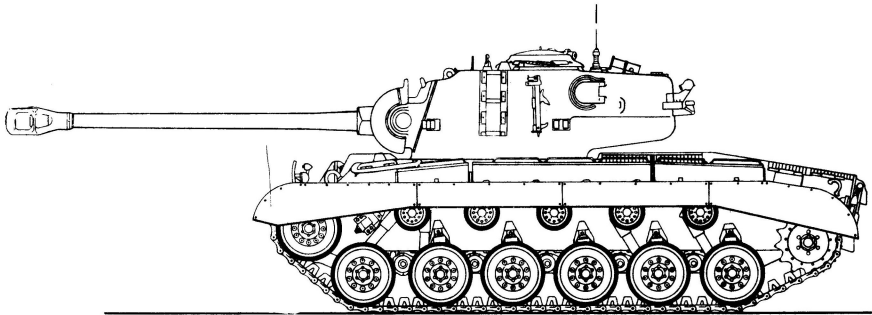
Front: at 10 degrees.

Sides: at 18 degrees.

Rear: at 0 degrees.

Roof: at 77 and 90 degrees.

British Standard Angles: 0 degrees = Vertical 90 degrees = Horizontal.



MEDIUM TANK M 26 PERSHING

SCALE 1:76 (4mm to 1 foot) Drawn by D.P.DYER

With the production of the Medium M.4 well under way in September 1942, the American Ordnance Department commenced development of a more powerful Medium Tank. The experiments were planned so that three types of transmission were to be tested; Torquematic in the Model T.20, Mechanical in the T.22, and Electric in the T.23. The armament was to be the 76mm gun M.1, although both a 75mm gun with automatic loading and the 3" gun M.7 were also proposed. Armour was to be up to $\frac{1}{2}$ " thicker than that on the M.4 Medium.

The first pilot Model to appear was the T.23 in January 1943. The suspension was the same as that used on the Medium M.4 with the later type of vertical volute suspension. Drive was provided through sprockets at the rear. After tests of the pilots, various modifications were incorporated and production of 250 vehicles was authorised which were produced between November 1943 and December 1944. Both the T.20 and the T.22 appeared in June 1943 and incorporated the early Horizontal Volute Suspension with 16" tracks. Due to transmission difficulties these types were not developed further.

In May 1943, only four months after the pilot of the T.23 appeared, a development programme was instituted for 90mm gun tanks. Whilst using the same size turret ring as the M.4 and the 76mm gun tanks mentioned above, a larger turret was required. Electric transmission and torsion bar suspension were to be incorporated. The T.25, of which 40 were ordered, was to have the same armour thickness as the T.23, but the T.26 was to have the armour increased in thickness by up to 1". Development work and mock ups had been started when it was decided that the estimated weights would exceed the limits that would be satisfactory with electric drive. In view of this, the specifications were changed to Torquematic transmission and the designations altered to T.25.E.1 and T.26.E.1.

Forty Medium Tanks T.25.E.1 were produced between January and May 1944, but by this time major interest had shifted to the more heavily armoured T.26 and no further vehicles of the T.25 series were produced. Two vehicles had appeared under the designation of Medium Tank T.25, the first in January and the second in April 1944. These were however conversions of two T.23 Medium Tanks with 90mm guns in the larger turrets, and the later type of horizontal suspension with 23" tracks.

Ten T.26.E.1 Medium Tanks were produced with Torquematic transmission and one T.26 with electrical transmission as originally envisaged. All of these vehicles had torsion bar suspension with 24" tracks. In June 1944 Medium Tanks T.26 and T.26.E.1 were reclassified as heavy tanks. After extensive Proving Ground and Service Board tests resulting in various modifications limited procurement was recommended in December 1944. Vehicles incorporating the modifications specified were designated Heavy Tanks T.26.E.3. Limited production was approved in January 1945 and standardisation as the Heavy Tank M.26 was recommended in March. Production had commenced in November 1944 at Grand Blanc Tank Arsenal, followed by production at Detroit Tank Arsenal as from March 1945. By the end of hostilities a total of 1,436 of these Heavy Tanks M.26 had been produced.

The development programme starting with the T.20 series shows that the American Ordnance Department, at least, were always aware of the necessity of producing tanks that could hold their own against Enemy Armour. Many reasons have been given for the delay in producing a replacement for the M.4 series, but in fact the majority of Army Ground Force Generals just didn't consider a replacement necessary. After the German Offensive, these same Generals did a complete about face.

Whilst the M.26 only appeared in relatively small numbers, too late to have any significant effect, the development of the 76mm gun turret for the T.20 series was used to advantage in that these were grafted onto the M.4 series to upgun them just prior to the invasion of Europe.

Along with the development of the T.26.E.3. armed with the 90mm gun was the development of a similar vehicle armed with a 105mm Howitzer in a 360 degrees traverse turret. This was designated the T.26.E.2. and eventually appeared as the M.45. In order to increase the firepower of the M.26 experiments were carried out with the 90mm gun T.15.E.2 and the 25 vehicles with this armament were designated T.26.E.4. An assault version of the M.26 appeared with thicker armour which was designated T.26.E.5 and 27 of these were produced. Experiments conducted with the T.26.E.4 resulted in the development of the M.26.E.1 which had the 90mm gun T.54. The performance of this gun was identical to the T.15.E.2 but it used fixed one piece ammunition similar to the German 8.8cm KwK 43. Two vehicles only with this armament were manufactured. The M.26.A.1 was fitted with the 90mm gun M.3.A.1. Heavy tanks of the T.26 and M.26 series were reclassified as Medium Tanks in May 1946.

Technical Specification for Heavy Tank M.26.

Crew: 5.
Weight, Combat loaded: 92,000 lbs. 41.07 Long tons,
46 Short tons, 41.73 Tonnes.

Performance

Speed, Max. Road: 20 m.p.h. (32.2 Km.p.h.)
Cross Country: 5.18 m.p.h. (8.29 Km.p.h.)
Max. Gradient: 31 degrees. (60 degrees)
Fording depth: 4' 0" (122 cm)
Trench crossing: 8' 6" (259 cm)
Step: 3' 10" (117 cm)
Min. Turning circle: 63' 0" (19.2 metres)
Ground pressure: 12.7 lbs/sq.ins (0.982 Kg/sq.cm)
Range (internal fuel)
Road: 92 miles (148 Km)
Cross country: 62 miles (100 Km)
Power to weight ratio: (Net/Gross) 9 HP/ton.

Dimensions

Length overall: 28' 10" (879 cm)
Length: 21' 2" (645 cm)
Width overall: 11' 6" (350.5 cm)
Height: 9' 1" (277 cm)
Ground clearance: 1' 5 $\frac{1}{4}$ " (43.77 cm)
Turret ring dia: 5' 9" (175 cm)
Road wheel dia (overall) 2' 2" (66 cm)

Trackwork

Centres: 9' 2" (279.4 cm)
Length on ground: 12' 4" (376 cm)
Width: 2' 0" (61 cm)
Pitch: 6" (15.24 cm)
Number of links per track: 78.
Type: Cast steel rubber backed.

Mechanical Details

Engine: 1 x Ford GAF 60 degrees V-8 Petrol liquid cooled
500 bhp. at 2,600 rpm.
Transmission: Torquematic 3F IR
Steering: Controlled differential
Suspension: Torsion Bar.

Armament.

Main: 90mm Gun M3 in mount T99E2
Calibre, and length in calibres: 90mm (3.54 ins) L/53.
Traverse: 360 degrees. Operation: Power and hand traverse.
Elevation: plus 20 degrees, minus 10 degrees, stabilised.

Secondary armament:

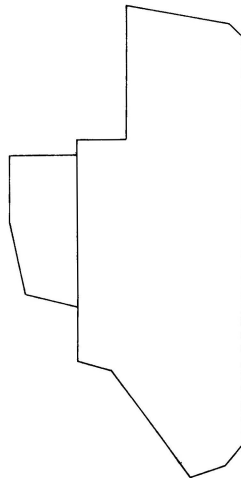
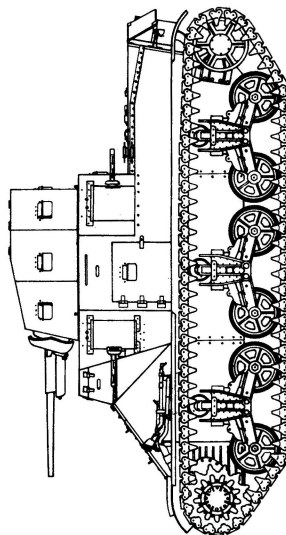
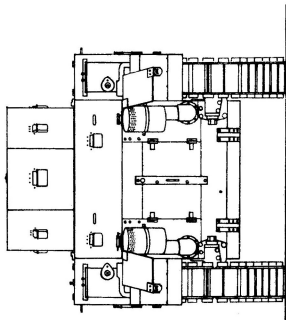
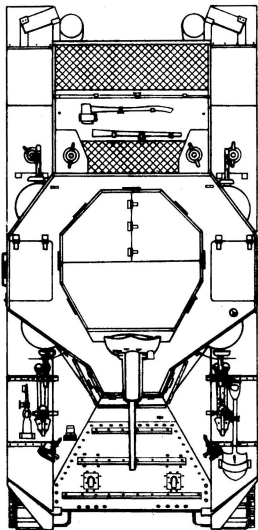
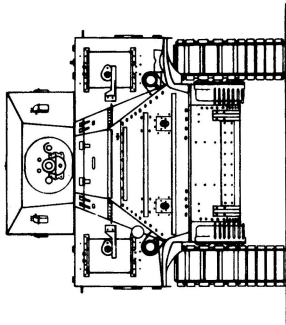
1 Cal .30 Mg M1919A4 Bow
1 Cal .30 Mg M1919A4 Coaxial
1 Cal .50 Mg H.B. M2 Turret roof

Stowage

Ammunition, main armament: 70 rds.
Ammunition, secondary armament: 5000 rds .30
550 rds .50
Internal Fuel capacity: 159.1 Imp. Gals.
191 U.S. Gals. 723 Litres.

Armour.

Hull, Nose upper: 4" (101.6 mm) at 46 degrees.
Nose lower: 3" (76.2 mm) at 53 degrees.
Sides, 3" (76.2 mm) vertical
2" (50.8 mm) "
Rear, upper: 2" (50.8 mm) at 10 degrees.
Decking: 7/8" (22.2 mm)
Engine covers:
Belly, Front: 1" (25.4 mm) Horizontal.
Rear: $\frac{1}{2}$ " (12.7 mm) Horizontal.
Turret
Front: 4" (101.6 mm)
Sides: 3" (76.2 mm)
Rear: 3" (76.2 mm)
Roof: 1" (50.8 mm)



MEDIUM TANK M2A1

SCALE 1:76 (4 mm to 1 foot) Drawn by D.P.DYER

MEDIUM TANK M.2.A.1 - 1938/41.

In America the "National Defense Act 1920" had assigned tanks to act as a subsidiary of the Infantry. It is therefore of little wonder that the Medium Tank T.5 produced by the Rock Island Arsenal in 1938 was built on the lines of a travelling pillbox, bristling with machine guns. Of these machine guns, two were fixed to fire forward, four were in sponson mountings at the corners of the fighting compartment, and two in anti-aircraft mountings on top of the fighting compartment. This fighting compartment or 'Barbette' being surmounted with a 360 degrees traverse turret carrying a 37mm anti-tank gun.

Because it only had a 250hp seven cylinder radial engine the Medium T.5 was found to be underpowered, which led to the fitting of a Wright nine cylinder radial engine of 350hp. The development model for this modification being the Medium T.5 phase 111. As originally built this vehicle appeared to fulfill the requirements of the Army, and the design was standardised as the Medium Tank M.2 in June 1939. As such it was the first tank to be standardised in the United States since 1919. Production on a small scale had commenced by August 1939.

The Armoured Force was formed on the 10th July 1940 and all armoured formations were put under this one command. The Medium M.2 was the only Medium tank they could expect as equipment, but an improved version was being developed, which would be the Medium M.2.A.1. Rock Island Arsenal could only manufacture tanks at a very slow rate, so with the National Defence programme under way, orders were placed with the Chrysler Motor Corporation on the 15th August 1940 for 1,000 Medium M.2.A.1 to be delivered at the rate of 100 per month commencing within a year.

The American Ordnance Department had been aware for a considerable time of the necessity of arming tanks with a larger gun than a 37mm, but had been informed by the Chief of Infantry that a weapon as powerful as a 75mm gun was needless. Events in Europe proved otherwise, and so, well aware that the Medium M.2.A.1 would be obsolete before it left the production line, Ordnance scrapped the contract with Chrysler thirteen days after it was placed. The order itself being substituted for the as yet undesigned Medium M.3 (Bellona Prints Series 15, No.57. (US)).

A total of 94 Medium M.2.A.1 were eventually produced at Rock Island Arsenal between December 1940 and August 1941, by which time the Medium M.3 was in production.

The Medium M.2.A.1 differed from the Medium M.2 in having a vertical sided turret with a horizontal rear roof. Vertical armour was increased in thickness from 1" to 1½". Track width was increased by 1" to avoid increased ground pressure due to the extra weight, and a supercharger was fitted to the engine to increase the power to 400 h.p. Detail improvements included slight modifications to the suspension units and idler brackets. Armour protection was added to the recoil housing and barrel of the 37mm gun. Tubular sights were fitted to the Sponson mounted machine guns, together with shields in front of the rotors. Pistol ports were covered with external flaps, and the petrol filler caps were covered with armoured covers. Anti-bullet splash rails were fixed to the glacis plate.

An interesting point with the American Medium tanks of the T.5, and M.2 series are the angled plates fitted to the extreme rear of the hull. By firing at these, the rear machine gunners could deflect bullets downwards when passing over enemy slit trenches.

As far as can be ascertained the only Medium M.2.A.1 still in existence is at Fort Knox, Kentucky. This vehicle is marred by having had a piece of tubing substituted for its main armament. Also at Fort Knox, is the Medium T.5 mounting twin 37mm guns. At the Army Proving Ground in Maryland, is preserved the second production Medium M.2, but this has been fitted with what would appear to be a development turret for the Medium M.2.A.1. One Medium M.2 was modified and fitted with a General Grant prototype turret in November 1940. Whilst this is only thought to be a mock up for the mounting, it could have been a feasibility project for Lease Lend prior to scrapping the M.2.A.1 design.

Technical Specification for Medium Tank M.2.A.1.

Crew: 6.
Weight, Combat loaded: 47,040 lbs. 21 Long tons,
23.52 Short tons. 21.33 Tonnes.

Performance

Speed, Max. Road: 26 m.p.h. (41.8 Km.p.h.)
Max. Gradient: 25 degrees.
Trench Crossing: 7' 6" (228.6 cm)
Step: 2' 0" (61 cm)
Range (internal fuel), Road: 130 Miles (209 Km)

Dimensions

Length overall: 17' 6" (533 cm)

Width overall: 8' 6" (259 cm)
Height: 9' 3" (282 cm)
Ground clearance: 1' 5" (43 cm)
Fire height of gun: 7' 10" (239 cm)
Turret ring dia: 4' 4" (132 cm)

Road wheel dia: (overall) 1' 8" (51 cm)

Trackwork

Centres: 6' 9" (206 cm)
Length on ground: 12' 0" (366 cm)
Width: 1' 2" (35.5 cm)
Pitch: 5½" (13.97 cm)
Number of links per track: 81.
Type: (Rubber Block
(Dry Pin, Double pin per shoe, Rubber cleat.

Mechanical Details.

Engine: 1 x Wright 9-cylinder Radial air cooled.
Petrol, supercharged. 400 hp. at 2,400 rpm

Transmission: Constant Mesh five forward, one reverse.
Steering: Controlled differential.
Suspension: Vertical volute spring, three bogies of two wheels each and three return rollers each side.

Armament.

Main: 37mm M.6 in mount M.19
Calibre, and length in calibres: 37mm (1.452 ins) L/53.
Traverse: 360 degrees. Operation: Single speed hand operated.
Secondary armament: 2 x .30 Cal MG's fixed front plate.
4 x .30 Cal MG's Sponson mounts.
2 x .30 Cal MG's A/Aircraft.

Stowage

Ammunition, main armament: 200 rds.
Ammunition, secondary armament: 12,250 rds.
Internal Fuel capacity: 113.3 Imp. gals. 136 U.S. gals. 515 Litres.

Armour

Type: Rolled plate riveted to structural angles.

Hull, Nose upper: 1" (25.4 mm) at
Nose lower: 1.1/8" (28.6 mm)
Drivers plate: 1" (25.4 mm)
Sides, upper: 1½" (32 mm)
lower: 1" (25.4 mm)

Decking: 3/8" (9.52 mm) Structural nickel steel.

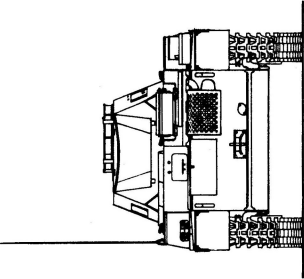
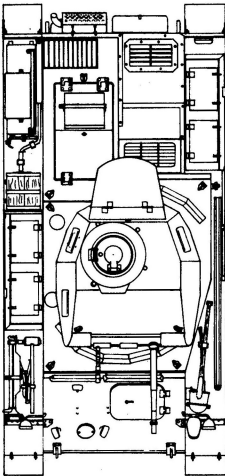
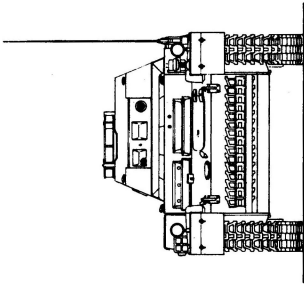
Engine covers: 3/8" (9.52 mm)

Belly, Front: ½" (12.70 mm)

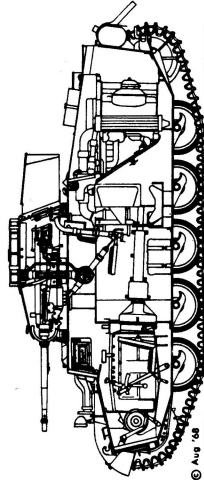
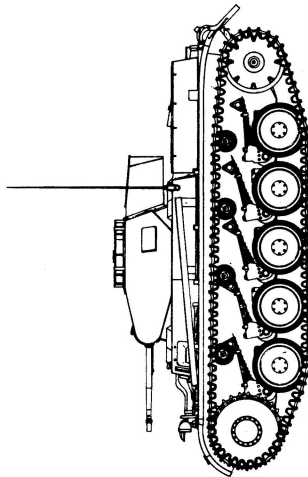
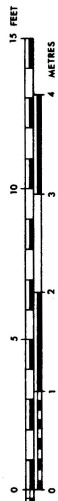
Rear: ½" (6.35 mm)

Turret

Front: 1.3/16" (30.15 mm)
Sides: 1" (25.4 mm) at 90 degrees.
Rear: 1" (25.4 mm) at 90 degrees.
Roof: 3/8" (9.52 mm) at 0 degrees.



W.D.



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PANZERKAMPFWAGEN II AUSF. F.

SCALE 1:76 (4 mm to 1 foot) DRAWN BY H.L. DOYLE.

PANZERKAMPFWAGEN II AUSF.F. (Sd.Kfz.121) - 1940/44.

Historical research by Walter J. Spielberger.

General Heinz Guderian indicates in his book, "Panzer-Leader" some of the reasons for the development of the Panzer II: "Since the production of the anticipated main types of battle tanks (Panzer III & IV) was delayed much longer than originally anticipated, General Lutz decided upon another interim solution, namely the Panzer II, built by Maschinenfabrik Augsburg-Nuremberg. An appropriate production order was issued in July 1934, to the companies of Frederick Krupp, Essen; Henschel & Sohn, Kassel, and MAN, Nuremberg.

Under the code name 'LAS 100', the prototypes built by these companies were thoroughly tested and the final production order awarded to MAN. They were made responsible for the chassis, while Daimler-Benz of Berlin-Marienfelde developed the armored superstructure. In addition, these vehicles were also built by Famo of Breslau (1936-1943), Wegmann of Kassel (1935-1941) and MIAG of Braunschweig (1936-1940). 1935 saw the introduction of the first production model, to armoured formations, under the official designation Panzerkampfwagen II (2 cm) (Sd.Kfz.121). Following this Ausf. a-1 was the Ausf. a-2, also in 1935. Ausf. a-3 appeared in 1936, to be followed by Ausf.b in the same year. Ausf. c was introduced in 1937; Ausf. A, B & C were introduced between 1937 and 1940. Nine hundred & fifty-five Panzer II were assigned to Panzer Divisions attacking France in 1940.

Inventory figures of July 1, 1941, indicated the availability of 1067 Panzer II. This figure was reduced by April 1, 1942, to 860 units. The experience of the campaign against Russia proved these vehicles soon to be unsuited for armoured attacks against Russian tank and anti-tank weapons. They were still issued to armoured formations for reconnaissance purposes and served furthermore in numbers as self-propelled mounts for a variety of applications. (e.g. Wespe. Sd.Kfz. 124. Bellona Prints Series 5, No.20 (GE) .

The early models of the Panzer II had the hull nose formed by the blending of a single plate, incorporating the glacis plate and the front belly plate. With the improvement of anti-tank weapons it became necessary to improve the protection by welding additional plates on all the frontal areas of the tank.

The Ausf.F. appearing in 1940, had an entirely new construction, the nose of the hull was now made of single skin construction using flat plates. The construction was greatly simplified and speeded production, while giving improvements in protection and savings in weight. This saving in weight was offset by increasing the thickness of armour to 35mm for the nose and to 30mm on all other frontal surfaces, both on the hull and turret.

The front vertical plate of the superstructure was now in an uninterrupted length across the entire vehicle. One remarkable feature was a dummy visor mounted alongside the driver's visor, presumably for decoy purposes. This dummy visor did not cover any aperture and was manufactured from a one-piece aluminium casting. Still further a vision slit appeared on the off-side superstructure, despite the fact that this area was completely inaccessible to any member of the crew because of the gear box. Suspension, with the exception of the idler wheels, which were of a new conical design was identical to previous versions, as was the mechanical layout.

Production target for 1942 was still 45 units a month, a figure which was, however, consistently not reached mainly because other vehicles already took priority to the Panzer II production. The chassis production ceased by the beginning of 1944. A total of 623 Panzer II vehicles was completed during this year. Subsequent attempts to revive the Panzer II programme were met with failure, and only prototypes continued under development.

To sum up, the Panzer II, originally intended only as a training tank, played an important role in the forming of Panzer divisions and served its purpose fully during the initial campaigns of the war. It was a reliable fighting vehicle. Starting in 1941, however, it was soon rendered obsolete by the appearance of improved enemy fighting vehicles on all fronts.

The Ausf F was allocated the chassis number block from 28000 to 29400. A vehicle captured in North Africa by the British was examined by the D.T.D. and is now displayed in the R.A.C. Tank Museum, Bovington, England. The chassis number of this vehicle is 28434. Further examples of this type of vehicle are on display at the Armour Proving Ground Aberdeen, Maryland in the United States.

The main armament, the 2cm KwK 30 or KwK 38 were derivatives of the 2cm FLAK 30 and FLAK 38. However, in each case the barrel of the tank is shorter, and pitch of rifling different. These guns were fed by a 10-round box, the 20-round box of the Flak equipment was too large for operation in AFV's.

Technical Specification for Panzerkampfwagen II Ausfuerung F.

Crew: 3
Weight: Combat loaded: 20945 lbs. 9.35 Long tons,
10.47 Short tons, 9.5 Tonnes.

Performance

Speed, Max. Road: 24.85 m.p.h. (40 Km.p.h.)
Max. Gradient: 30 degrees.
Fording depth: 3' 0 1/2" (92.5 cm)
Trench crossing: 5' 7" (170 cm)
Step: 1' 4 1/2" (42 cm)
Min. Turning circle: 15' 9" (4.8 metres)
Ground pressure: 10.8 lbs/sq.ins (0.76 Kg/sq.cm)
Range (internal fuel) Road: 118 miles (125 Km)
Cross country: 77.7 Miles (125 Km)
Power to weight ratio: 14.75 Metric HP/ton.

Dimensions

Length: 15' 9 1/2" (481 cm)
Width: 7' 5 1/2" (228 cm)
Height: 6' 7 1/2" (202 cm)
Ground clearance: 1' 1 1/2" (34.5 cm)
Fire height of gun: 5' 2 1/2" (159.5 cm)
Turret ring dia: 3' 10" (116.8 cm)
Trackwork

Centres: 6' 2" (188 cm)
Length on ground: 7' 10 1/2" (240 cm)
Width: 11 1/2" (30 cm)
Pitch: 3 5/8" (9.21 cm)

Number of links per track: 106/107.

Mechanical Details.

Engine: 1 x Maybach HL 62 TR, 6-cylinder inline, water cooled petrol engine of 6.191 litres developing 140 bhp at 2600 rpm

Transmission: ZF SSG 46 gearbox with 6 forward and 1 reverse speeds.
Steering: Epicyclic clutch and brake.
Suspension: Five equally spaced rubber tyred bogie wheels on each side with quarter elliptic leaf springs.

Armament.

Main: 1 x 2cm KwK 30 or 38.
Calibre, and length in calibres: 20 mm (0.78 ins), L/97.16.
Traverse: Turret 360 degrees. Operation: Hand.
Elevation: plus 20 degrees, minus 9.5 degrees.
Secondary armament: 1 x 7.92 mm MG 34.

Stowage

Ammunition, main armament: 180 rds.
secondary armament: 255 rds.
Internal Fuel capacity: 37.42 Imp. gals. 44.92 U.S. gals.
170 Litres.

Armour.

Type:
Hull, Nose upper: 1.368" (35 mm) at 77 degrees.
Nose lower: 0.780" (20 mm) at 16 degrees.
Glacis plate: 0.780" (20 mm) at 90 degrees.
Drivers plate: 1.176" (30 mm) at 80 degrees.
Sides: 0.780" (20 mm) at 90 degrees.
Rear: 0.588" (15 mm) at 81 degrees.
Decking: 0.384" (10 mm) at 0 and 8 degrees.
Belly: 0.192" (5 mm) at 0 degrees.
Turret

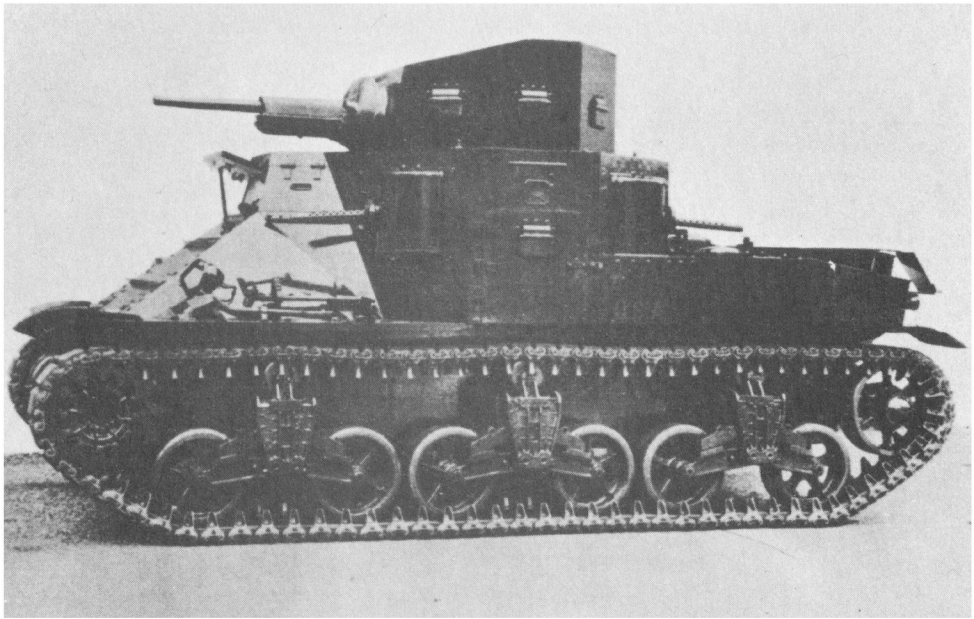
Front: 7.176" (30 mm) rounded.
Sides and rear: 0.588" (15 mm) at 68 degrees.
Roof: 0.384" (10 mm) at 0 + 16 degrees.

NOTE - German standard angles 0 degrees = Horizontal
90 degrees = Vertical.

Vision, Sights: TZ F4

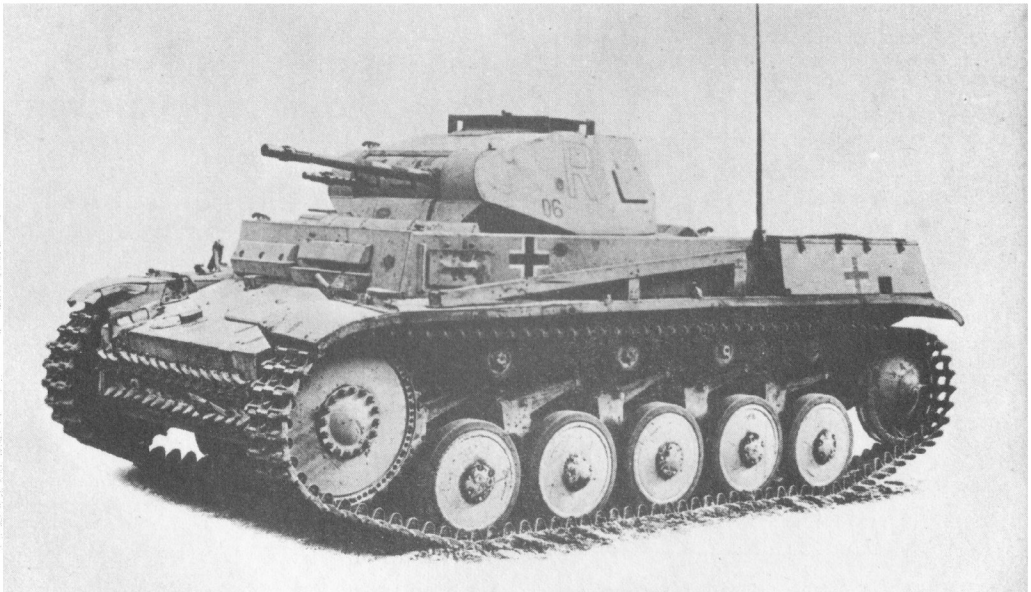
Communications 1 x FU 5, 10 watt transmitter ultra short-wave receiver
27200 - 33300 Kc/s

Range: WT-2.5 miles (4 Km) RT-1.25 miles (2 Km)



Above: While having the same trackwork used for the M3 and M4 tanks, the difference in these tanks is tremendous. The M2 was developed primarily as an Infantry weapon and consists of an armoured pill box defended by machine guns on all four corners. An interesting point is the angled plates at the back which were used to deflect bullets down into slit trenches which the tank had passed over. (Official U.S. Photo)

Below: This Panzerkampfwagen II Ausf F. is now on display at the Royal Armoured Corps Tank Museum, Bovington, England. It was captured in Africa. Markings show that it was from the Headquarters troop of reconnaissance vehicles. (Imperial War.Museum Photo)



The 90 mm Gun M 3 is a flat trajectory weapon with an automatically operated vertical sliding droptype breechblock. The gun, together with one .30 cal. flexible MG M1919 A4, is mounted coaxially in the combination gun mount M 67. The same gun was also mounted in the gun motor carriage M 36, in the mount M4 (picture 1), and in the gun motor carriage M 36 B1 and M 36 B2, in the mount M4 A1.

Calibre: 90mm (3.54") Rate of fire: 8 rounds per min:

Length: 15' 6" (472.5cm)

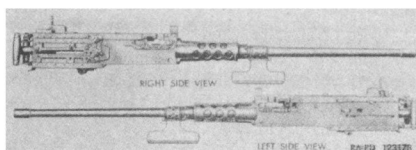
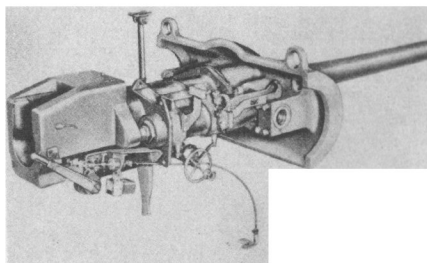
Muzzle Velocity:

Max. range.

HE, Smoke	2,700 fps (823 ms)	19,560 yds (17886 metres)
APC-T	2,800 fps (853 ms)	21,400 yds (19568 metres)
HVAP-T	3,350 fps (1021 ms)	15,700 yds (14256 metres)

Ammunition: Fixed.

Type:	Weight: compl. Round	Projectile	Powder charge
HE	41.9 lb (19.0 kg)	23.4 lb (10.6 kg)	7.3 lb (3.5 kg)
Smoke	42.0 lb (19.1 kg)	23.4 lb (10.6 kg)	7.3 lb (3.3 kg)
APC-T	43.9 lb (19.8 kg)	24.1 lb (10.9 kg)	8.0 lb (3.7 kg)
HVAP-T	37.1 lb (16.8 kg)	16.8 lb (7.6 kg)	8.4 lb (3.8 kg)



Cal. .50 M.G. M.2, HEAVY BARREL, Flexible.

One cal. .50 HB machine gun M.2 is mounted in a bracket-type mount on top of the turret. The M.G. is employed chiefly against aircraft, is elevated and traversed manually, and fired by the conventional trigger.

Weight: 84 lbs. (38.10 Kg) Rate of fire: 450-550 rd/Min.

Length: 5' 5" (165.1 cm)

Operation: Short recoil.

Feed: disintegrating metallic link belt.

Muzzle Velocity

Max. range.

API	M8	3,050 fps 930 ms.	6,470 (5916 m) (Approx)
Ball.	M2	2,930 fps 893 ms.	7,460 (6821 m) (Approx)
Max. effective range 2000 yds (Approx) (2187 m) (Approx)			

Cal. .30 MG, M 1919 A4, flexible.

One cal. .30 M 1919 A4 is mounted coaxially with the main gun in the combination mount M 67. A second M.G. of the same type is mounted in a bow mount in the right foot side of the vehicle, elevated and traversed manually, and fired by conventional trigger.

Weight: 31.16" (14.06 Kg) Rate of fire: 450 - 600 rd/min.

Length: 3' 6" (107 cm)

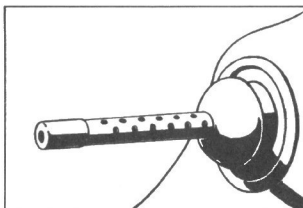
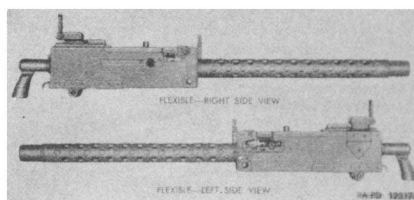
Operation: short recoil.

Feed: disintegrating metallic link belt.

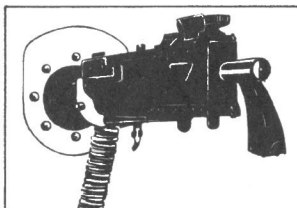
Muzzle Velocity

Max. range.

AP, M2	2770 fps (846 ms)	3160 yds (2890 m)
Ball, M2	2800 fps (853 ms)	3500 yds (3200 m)



Bow Mount (outside)



Bow Mount (inside)